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EXAMINER	
HOLDER, ANNER N	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/811,983	PURI ET AL.	
	Examiner	Art Unit	
	ANNER HOLDER	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 July 2008*.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35 and 37-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35 and 37-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 July 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/17/09 has been entered.

Response to Arguments

2. Applicant's arguments filed 03/17/09 have been fully considered but they are not persuasive. As to Applicant's arguments regarding claims 34-35 and 37-39 the Examiner respectfully disagrees. The Hui (modified by Sugiyama and Simpson) teaches the zeroing of motion vectors. [Simpson - fig. 1 (18); fig. 2 (118); col. 5 lines 5-59; col. 3 line 66 - col. 4 line 25]

3. Applicant's arguments with respect to claims 1-33 and 40-43 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 9-11, 23-26, 40, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajime US 6,915,015 B2 in view of Noh et al. US 7,079,581 B2 further in view Chiang et al. (Chiang), A new rate Control Scheme Using Quadratic Rate Distortion Model, IEEE, 1996, pgs. 73-76.

6. As to claim 1, Tajime teaches a picture analyzer, to generate complexity indicators from each picture of an input video sequence; [fig. 6; fig. 1; col. 4 lines 34-54; col. 8 lines 11-18, 46-67] a first quantizer estimator to generate a first quantizer estimate for each picture based on the complexity indicators, [fig. 2; fig. 3; col. 9 lines 12-60; col. 12 lines 24-47; col. 8 lines 19-37] a target coding rate calculated for each picture; [fig. 6; col. 11 line 51 - col. 12 line 15] a second quantizer estimator, to generate a second quantizer estimate for each picture, the second quantizer estimates for I and P pictures based on coding rates of previously-coded pictures; [fig. 1; fig. 6; fig. 15 col. 8 lines 19-44; col. 13 lines 18-45, 47-67; col. 14 lines 33-42] and a quantizer selector to generate a quantizer parameter for each picture from the first and second quantizer estimates; [fig. 2; fig. 3; col. 9 lines 12-60; col. 10 lines 3-23; col. 12 lines 24-47] and a coding policy unit operative according to a rate control policy, wherein the rate control policy is informed by a comparison of the first and second quantizer estimate. [fig. 6; col. 11 line 51 - col. 12 line 15]

Tajime does not explicitly teach the use of linear regression regarding a quantizer and a transmit buffer fullness indicator representing a quantity of stored previously-coded video data.

Noh teaches a transmit buffer fullness indicator representing a quantity of stored previously-coded video data. [col. 9 lines 1-7]

It would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the teachings of Noh with the device of Tajime allowing for reduced deterioration of image quality.

Tajime (modified by Noh) does not explicitly teach the use of linear regression regarding a quantizer

Chiang teaches linear regression in determining a quantizer value. [abstract; 1. Introduction ¶ 1; 5. Rate Control for the MPEG-4 Coder]

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the linear regression teachings of Chiang with the device of Tajime Modified by Noh) improving image quality and coding efficiency.

7. As to claim 9, Tajime (modified by Noh and Chiang) teaches the complexity indicator includes an indicator of spatial complexity within the picture. [Tajime - fig. 6; fig. 1; col. 4 lines 34-54; col. 8 lines 11-18, 46-67]

8. As to claim 10, Tajime (modified by Noh and Chiang) teaches the complexity indicator includes an indicator of motion complexity of the picture with respect to previously coded pictures. [Tajime - fig. 6; fig. 1; col. 4 lines 34-54; col. 8 lines 11-18, 46-67]

9. As to claim 11, Tajime (modified by Noh and Chiang) teaches the complexity indicator includes an indicator of a number of bits used to represent each pixel in the picture. [Tajime - fig. 6; fig. 1; col. 4 lines 34-54; col. 8 lines 11-18, 46-67]

10. As to claim 23, Tajime (modified by Noh and Chiang) teaches a content characteristics and coding rate analyzer, responsive to pictures from an input video sequence, to generate complexity indicators representative thereof, [Tajime - fig. 6; fig. 1; col. 4 lines 34-54; col. 8 lines 11-18, 46-67] a rate model quantizer estimator, responsive to quantizers and coding rates of previously-coded pictures and to picture type indicators of input pictures, to estimate quantizer parameters of the input pictures [Tajime - fig. 6; col. 11 line 51 - col. 12 line 15] according to a linear regression analysis, wherein linear regression [Chiang - abstract; 1. Introduction ¶ 1; 5. Rate Control for the MPEG-4 Coder] coefficients of input I pictures are selected according to the complexity indicators for such I pictures, an AVC coder including a forward quantizer operative according to the quantizer estimates. [Tajime - fig. 2; fig. 3; col. 9 lines 12-60; col. 10 lines 3-23; col. 12 lines 24-47; coefficients represent a change in the pixel which is selective reduces the bit rate]

11. As to claim 24, see discussion of claim 9 above.

12. As to claim 25, see discussion of claim 10 above.

13. As to claim 26, see discussion of claim 11 above.

14. As to claim 40, see discussion of claim 1 above.

15. As to claim 44, see discussion of claim 1 above.

16. Claims 1, 9-11, 23-26, 40, 44 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajime US 6,915,015 B2 in view of Chiang et al. (Chiang), A

new rate Control Scheme Using Quadratic Rate Distortion Model, IEEE, 1996, pgs. 73-76.

17. As to claim 48, Tajime (modified by Noh and Chiang) teaches a content characteristics and coding rate analyzer, responsive to pictures from an input video sequence, to generate complexity indicators representative thereof, [Tajime - fig. 6; fig. 1; col. 4 lines 34-54; col. 8 lines 11-18, 46-67] a target bits computer, responsive to the complexity indicators and to a picture type signal, to calculate a target coding rate for each picture in the video sequence, [col. 12 lines 1-16; col. 13 lines 48-58] a buffer based quantizer computer, responsive to the target coding rates, to a transmit buffer indicator signal and to the picture type signal, to generate a buffer-based quantizer estimate for each picture, and an activity based quantizer computer to calculate activity of each picture in the video sequence and modify the buffer-based quantizer estimate in response thereto, a rate model quantizer estimator, responsive to quantizers and coding rates of previously-coded pictures and to picture type indicators of input pictures, to estimate quantizer parameters of the input pictures [Tajime - fig. 6; col. 11 line 51 - col. 12 line 15] according to a linear regression analysis, wherein linear regression [Chiang - abstract; 1. Introduction ¶ 1; 5. Rate Control for the MPEG-4 Coder] coefficients of input I pictures are selected according to the complexity indicators for such I pictures, an AVC coder including a forward quantizer operative according to the quantizer estimates; [Tajime - fig. 2; fig. 3; col. 9 lines 12-60; col. 10 lines 3-23; col. 12 lines 24-47; coefficients represent a change in the pixel which is selective reduces the bit rate]

an AVC coder including a forward quantizer operative according to the modified buffer-based quantizer estimate. [fig. 6; col. 11 line 51 - col. 12 line 16; col. 9 lines 43-61]

Tajime does not explicitly teach the use of linear regression regarding a quantizer

Chiang teaches linear regression in determining a quantizer value. [abstract; 1. Introduction ¶ 1; 5. Rate Control for the MPEG-4 Coder]

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the linear regression teachings of Chiang with the device of Tajime Modified by Noh) improving image quality and coding efficiency.

18. Claims 2, 8, 27 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajime US 6,915,015 B2 in view of Noh et al. US 7,079,581 B2 in view Chiang et al. (Chiang), A new rate Control Scheme Using Quadratic Rate Distortion Model, IEEE, 1996, pgs. 73-76. and further in view of Kim US 5,777,812.

19. As to claim 2, Tajime (modified by Noh and Chiang) teaches the limitations of claim 1.

Tajime (modified by Noh and Chiang) is silent as a transform scaler, coupled to the forward quantizer, a forward scan unit, coupled to the transform scaler, a variable length coder, coupled to the forward scan unit, and a formatter, coupled to the variable length coder.

Kim teaches a transform scaler, coupled to the forward quantizer, a forward scan unit, coupled to the transform scaler, a variable length coder, coupled to the forward scan

unit, and a formatter, coupled to the variable length coder. [fig. 6; col. 5 line 64 – col. 6 line 7]

It would have obvious to one of ordinary skill in the art to incorporate the teachings of Kim with the device of Tajime (modified by Noh and Chiang) to allow for improved image coding and quality.

20. As to claim 8, Tajime (modified by Noh, Chiang and Kim) teaches a spatial predictor that predicts video data for a block of input data according to intra prediction techniques, a temporal predictor that predicts video data for the block of input data according to temporal predictions between a current picture and one or more previously coded reference frames, [Tajime - fig. 13; col. 2 lines 1-13; fig. 6; fig. 1; col. 4 lines 34-54; col. 8 lines 11-18, 46-67] and a mode selector that selects an output from one of the spatial predictor or the temporal predictor for each block of input data, wherein the mode selector performs its selection based on mode decision control signals from the coding policy unit. [Tajime - fig. 13; col. 2 lines 1-13; fig. 6; fig. 1; col. 4 lines 34-54; col. 8 lines 11-18, 46-67]

21. As to claim 27, see discussion of claim 2 above.

22. As to claim 33, see discussion of claim 8 above.

23. Claims 3, 28, 41 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajime US 6,915,015 B2 in view of Noh et al. US 7,079,581 B2 in view Chiang et al. (Chiang), A new rate Control Scheme Using Quadratic Rate

Distortion Model, IEEE, 1996, pgs. 73-76. in view of Kim US 5,777,812 further in view of Simpson et al. (Simpson) US 6,724,817 B1.

24. As to claim 3, Tajime (modified by Noh, Chiang and Kim) the limitations of claim 2.

Tajime (modified by Noh, Chiang and Kim) does not explicitly teach to eliminate non-zero quantized transform coefficients according to a rate control policy, and wherein the AVC coder further comprises a coefficient zeroer provided between the forward quantizer and the transform scaler, responsive to control from the coding policy unit, to eliminate selected quantized transform coefficients.

Simpson teaches to eliminate non-zero quantized transform coefficients according to a rate control policy, and wherein the AVC coder further comprises a coefficient zeroer provided between the forward quantizer and the transform scaler, responsive to control from the coding policy unit, to eliminate selected quantized transform coefficients. [fig. 1 (18); fig. 2 (118); col. 5 lines 5-59; col. 3 line 66 - col. 4 line 25]

It would have been obvious to one of ordinary skill in the art to combine the teachings of Simpson with the device of Tajime (modified by Noh, Chiang and Kim) improving coding efficiency.

25. As to claim 28, see discussion of claim 3 above.

26. As to claim 41, see discussion of claim 3 above.

27. As to claim 45, see discussion of claim 3 above.

28. Claims 4, 5, 29-30, 42-43 and 46-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajime US 6,915,015 B2 in view of Noh et al. US 7,079,581 B2 in view Chiang et al. (Chiang), A new rate Control Scheme Using Quadratic Rate Distortion Model, IEEE, 1996, pgs. 73-76. in view of Kim US 5,777,812 and further in view of Sugiyama US 6,940,911 B2.

29. As to claim 4, Tajime (modified by Noh, Chiang and Kim) teaches limitations of claim 2.

Tajime (modified by Noh, Chiang and Kim) does not explicitly teach to a coding policy unit, determines when it becomes necessary to eliminate pictures from the video sequence from being coded according to a rate control policy, and a video preprocessing unit, responsive to control from the coding policy unit, to perform frame decimation before pictures are input to the AVC coder.

Simpson teaches a coding policy unit, determines when it becomes necessary to eliminate pictures from the video sequence from being coded according to a rate control policy. [fig. 1 (18); fig. 2 (118); col. 5 lines 5-59; col. 3 line 66 - col. 4 line 25]

It would have been obvious to one of ordinary skill in the art to combine the teachings of Simpson with the device of Tajime (modified by Noh, Chiang and Kim) improving coding efficiency.

Tajime (modified by Noh, Chiang, Kim and Simpson) is silent as to a video preprocessing unit, responsive to control from the coding policy unit, to perform frame decimation before pictures are input to the AVC coder.

Sugiyama teaches a video preprocessing unit, responsive to control from the coding policy unit, to perform frame decimation before pictures are input to the AVC coder. [fig. 1; fig. 7; fig. 11; fig. 14; col. 15 lines 10-19, 61-67; col. 16 lines 3-7]

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Sugiyama with the device of Tajime (modified by Noh, Chiang, Kim and Simpson) allowing for improved of the image quality.

30. As to claim 5, Tajime (modified by Noh, Chiang, Kim, Simpson and Sugiyama) teaches the limitations of claim 2, further comprising a coding policy unit, to determine when it becomes necessary to eliminate motion vectors according to a rate control policy, [Simpson - fig. 1 (18); fig. 2 (118); col. 5 lines 5-59; col. 3 line 66 - col. 4 line 25] and wherein the AVC coder includes a prediction circuit that generates motion vectors for prediction of video data of macroblocks in the input pictures and of video data for sub-blocks therein of various sizes, the prediction circuit responsive to control from the coding policy unit, to eliminate selected motion vectors from an output coded bitstream. [Simpson - fig. 1 (18); fig. 2 (118); col. 5 lines 5-59; col. 3 line 66 - col. 4 line 25; Sugiyama - Fig. 7; Fig. 11; Fig. 14; Col. 15 lines 10-19, 61-67; Col. 16 lines 3-7]

31. As to claim 29, see discussion of claim 4 above.

32. As to claim 30, see discussion of claim 5 above.

33. As to claim 42, see discussion of claim 4 above.

34. As to claim 43, see discussion of claim 5 above.

35. As to claim 46, Tajime (modified by Noh and Chiang) teaches the limitations claim 44.

Tajime (modified by Noh and Chiang) does not explicitly teach determines when it becomes necessary to eliminate pictures from the video sequence from being coded according to a rate control policy, and performing frame decimation before pictures are encoded.

Simpson teaches determines when it becomes necessary to eliminate pictures from the video sequence from being coded according to a rate control policy. [fig. 1 (18); fig. 2 (118); col. 5 lines 5-59; col. 3 line 66 - col. 4 line 25]

It would have been obvious to one of ordinary skill in the art to combine the teachings of Simpson with the device of Tajime (modified by Noh, Chiang and Kim) improving coding efficiency.

Tajime (modified by Noh, Chiang, Kim and Simpson) does not explicitly teach to perform frame decimation before pictures are input to the AVC coder.

Sugiyama teaches to perform frame decimation before pictures are input to the AVC coder. [fig. 1; fig. 7; fig. 11; fig. 14; col. 15 lines 10-19, 61-67; col. 16 lines 3-7]

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Sugiyama with the device of Tajime (modified by Noh, Chiang, Kim and Simpson) allowing for improved of the image quality.

36. As to claim 47, Tajime (modified by Noh, Chiang, Kim, Simpson and Sugiyama) teaches generating motion vector predication of video data of macroblocks in the input pictures and of video data for sub-blocks therein of various sizes, [Sugiyama - Fig. 7; Fig. 11; Fig. 14; Col. 15 lines 10-19, 61-67; Col. 16 lines 3-7]determining when it becomes necessary to eliminate motion vectors according to the rate control policy, and

eliminating selected motion vectors from an output coded bitstream. [Simpson - fig. 1 (18); fig. 2 (118); col. 5 lines 5-59; col. 3 line 66 - col. 4 line 25]

37. Claims 6-7, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajime US 6,915,015 B2 in view of Noh et al. US 7,079,581 B2 in view Chiang et al. (Chiang), A new rate Control Scheme Using Quadratic Rate Distortion Model, IEEE, 1996, pgs. 73-76. in view of Kim US 5,777,812 and further in view of Tsuru US 6,950,040 B2.

38. As to claim 6, Tajime (modified by Noh, Chiang and Kim teaches the limitations of claim 2.

Tajime (modified by Noh, Chiang and Kim) does not explicitly teach a deblocking filter.

Tsuru teaches a deblocking filter. [fig. 2; col. 6 lines 3-12]

It would have been obvious at the time the invention was made to combine the deblocking filtering teachings of Tsuru with the device of Tajime (modified by Noh, Chiang and Kim) improving image quality.

39. As to claim 7, Tajime (modified by Noh, Chiang, Kim and Tsuru) the coding policy unit calculates alpha and beta control parameters to be used by an H.264 deblocking filter. [Tsuru - fig. 2; col. 1 lines 12-15; col. 6 lines 3-12; well known in the art that alpha and beta parameters are used in deblocking]

40. As to claim 31, see discussion of claim 6 above.

41. As to claim 32, see discussion of claim 7 above.

42. Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajime US 6,915,015 B2.

43. As to claim 12, Tajime teaches a content characteristics and coding rate analyzer, responsive to pictures from an input video sequence, to generate complexity indicators representative thereof, [col. 8 lines 11-18; col. 12 lines 19-30; col. 13 lines 48-58] a target bits computer, responsive to the complexity indicators and to a picture type signal, to calculate a target coding rate for each picture in the video sequence, [col. 12 lines 1-16; col. 13 lines 48-58] a buffer based quantizer computer, responsive to the target coding rates, to a transmit buffer indicator signal and to the picture type signal, to generate a buffer-based quantizer estimate for each picture, and an activity based quantizer computer to calculate activity of each picture in the video sequence and modify the buffer-based quantizer estimate in response thereto, an AVC coder including a forward quantizer operative according to the modified buffer-based quantizer estimate. [fig. 6; col. 11 line 51 - col. 12 line 16; col. 9 lines 43-61]

44. As to claim 13, Tajime teaches the complexity indicator includes an indicator of spatial complexity within the picture. [fig. 6; fig. 1; col. 4 lines 34-54; col. 8 lines 11-18, 46-67]

45. As to claim 14, Tajime teaches the complexity indicator includes an indicator of motion complexity of the picture with respect to previously coded pictures. [col. 7 lines 38-56; figs. 1-2; fig. 6]

46. As to claim 15, Tajime teaches the complexity indicator includes an indicator of a number of bits used to represent each pixel in the picture. [col. 8 lines 11-18]

47. Claims 16 and 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tajime US 6,915,015 B2 in view of Hui US 6,654,417 B1 in view of Kim US 5,777,812.

48. As to claim 16, Tajime teaches the limitations of claim 12.

Tajime does not explicitly teach an integer approximated transform circuit, to generate transform coefficients from input pixel data, the forward quantizer to divide the transform coefficients according to the modified buffer-based quantizer estimate.

Hui teaches an integer approximated transform circuit, to generate transform coefficients from input pixel data, the forward quantizer to divide the transform coefficients according to the modified buffer-based quantizer estimate. [Hui - fig. 2; fig. 3; col. 9 lines 12-60; col. 10 lines 3-23; col. 12 lines 24-47]

It would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the teachings of Hui with the device of Tajime allowing for improved image quality.

Tajime (modified by Hui) is silent as to a transform scaler, coupled to the forward quantizer, a forward scan unit, coupled to the transform scaler, a variable length coder, coupled to the forward scan unit, and a formatter, coupled to the variable length coder.

Kim teaches a transform scaler, coupled to the forward quantizer, a forward scan unit, coupled to the transform scaler, a variable length coder, coupled to the forward scan unit, and a formatter, coupled to the variable length coder. [Kim - fig. 6; col. 5 line 64 – col. 6 line 7]

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Kim with the device of Hui to allow for improved coding efficiency and image quality.

49. As to claim 22, Tajime (Hui and Kim) teaches a spatial predictor that predicts video data for a block of input data according to intra prediction techniques, a temporal predictor that predicts video data for the block of input data according to temporal predictions between a current picture and one or more previously coded reference frames, [Hui - figs. 2-3; col. 1lines 30-53; col. 5 lines 58-67; col. 6 lines 8-21] and a mode selector that selects an output from one of the spatial predictor or the temporal predictor for each block of input data, wherein the mode selector performs its selection based on mode decision control signals from the coding policy unit. [Hui - figs. 2-3; col. 1 lines 30-53; col. 5 lines 58-67; col. 6 lines 8-21]

50. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tajime US 6,915,015 B2 in view of Hui US 6,654,417 B1 in view of Kim US 5,777,812 further in view of Simpson et al. (Simpson) US 6,724,817 B1.

51. As to claim 17, Tajime (modified by Hui and Kim) teaches the limitations of claim 16.

Tajime (modified by Hui and Kim) does not explicitly teach to eliminate non-zero quantized transform coefficients according to a rate control policy, and wherein the AVC coder further comprises a coefficient zeroer provided between the forward quantizer

and the transform scaler, responsive to control from the coding policy unit, to eliminate selected quantized transform coefficients.

Simpson teaches to eliminate non-zero quantized transform coefficients according to a rate control policy, and wherein the AVC coder further comprises a coefficient zeroer provided between the forward quantizer and the transform scaler, responsive to control from the coding policy unit, to eliminate selected quantized transform coefficients. [fig. 1 (18); fig. 2 (118); col. 5 lines 5-59; col. 3 line 66 - col. 4 line 25]

It would have been obvious to one of ordinary skill in the art to combine the teachings of Simpson with the device of Tajime (modified by Hui and Kim) improving coding efficiency.

52. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajime US 6,915,015 B2 in view of Hui US 6,654,417 B1 in view of Kim US 5,777,812 and further in view of Sugiyama US 6,940,911 B2.

As to claim 18, Tajime (modified by Hui and Kim) teaches the limitations of claim 16,

Tajime (modified by Hui and Kim) does not explicitly teach a coding policy unit, to determine when it becomes necessary to eliminate pictures from the video sequence from being coded according to a rate control policy, and a video preprocessing unit, responsive to control from the coding policy unit, to perform frame decimation before pictures are input to the AVC coder.

Sugiyama teaches a coding policy unit, to determine when it becomes necessary to eliminate pictures from the video sequence from being coded according to a rate control

policy, and a video preprocessing unit, responsive to control from the coding policy unit, to perform frame decimation before pictures are input to the AVC coder. [Fig. 7; Fig. 11; Fig. 14; Col. 15 lines 10-19, 61-67; Col. 16 lines 3-7]

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Sugiyama with the device of Tajime (modified by Hui and Kim) allowing for improving of the image quality.

53. As to claim 19, Tajime (modified by Hui, Kim and Sugiyama) a coding policy unit, to determine when it becomes necessary to eliminate motion vectors according to a rate control policy, and wherein the AVC coder includes a prediction circuit that generates motion vectors for prediction of video data of macroblocks in the input pictures and of video data for sub-blocks therein of various sizes, the prediction circuit responsive to control from the coding policy unit, to eliminate selected motion vectors from an output coded bitstream. [Sugiyama - Fig. 7; Fig. 11; Fig. 14; Col. 15 lines 10-19, 61-67; Col. 16 lines 3-7]

54. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tajime US 6,915,015 B2 in view of Hui US 6,654,417 B1 in view of Kim US 5,777,812 and further in view of Tsuru US 6,950,040 B2.

55. As to claim 20, Tajime (modified by Hui and Kim) teaches the limitations of claim 16.

Tajime (modified by Hui and Kim) does not explicitly teach a deblocking filter.

Tsuru teaches a deblocking filter. [fig. 2; col. 6 lines 3-12]

It would have been obvious at the time the invention was made to combine the deblocking filtering teachings of Tsuru with the device of Tajime (modified by Hui and Kim) improving image quality.

56. As to claim 21, Tajime (modified by Hui, Kim and Tsuru) the coding policy unit calculates alpha and beta control parameters to be used by an H.264 deblocking filter. [fig. 2; col. 1 lines 12-15; col. 6 lines 3-12; well known in the art that alpha and beta parameters are used in deblocking]

57. Claims 34, 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hui US 6,654,417 B1 in view of Sugiyama US 6,940,911 B2 further in view of Simpson et al. (Simpson) US 6,724,817 B1.

58. As to claim 34, Hui teaches a rate controller having an input coupled to a source of video data and generating a quantizer selection on a picture-by-picture basis, [figs. 2-3; abstract; col. 5 lines 50-57; col. 9 lines 12-22; col. 12 lines 13-47] a video prediction chain to generate predicted video data on a block-by-block basis, [col. 12 lines 13-39; figs. 2-3; col. 5 lines 58-67; col. 8 lines 43-51] and a quantizer to receive data output from the transform circuit, the quantizer operative according to a quantizer parameter output from the rate controller. [figs. 2-3; abstract; col. 5 lines 50-57; col. 9 lines 12-22; col. 12 lines 13-47]

Hui is silent as to a block-based video coding chain including: a subtractor coupled to the source video data and to the video prediction chain, a transform circuit, to receive data output from the subtractor.

Sugiyama teaches a block-based video coding chain including: a subtractor coupled to the source video data and to the video prediction chain, a transform circuit, to receive data output from the subtractor. [fig. 1; figs. 6-7; col. 10 lines 52-67; col. 14 lines 42-50; col. 15 lines 1-22]

It would have been obvious to one of ordinary skill in the art at the time the invention was made incorporate the teachings of Sugiyama teaches with the device of Hui to improve image quality and coding efficiency.

Simpson teaches the video coding chain deletes motion vectors under control of the rate controller. [Simpson - fig. 1 (18); fig. 2 (118); col. 5 lines 5-59; col. 3 line 66 - col. 4 line 25]

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings to Simpson with the device of Hui (modified by Sugiyama) allowing for improved data transmission. [col. 1 lines 15-27]

59. As to claim 38, Hui (modified by Sugiyama and Simpson) teaches video prediction chain comprises a prediction mode decision unit whose mode of operation is controlled by the rate controller. [Hui - figs. 2-3; col. 1 lines 30-53; col. 5 lines 58-67; col. 6 lines 8-21; Sugiyama - fig. 1; figs. 6-7; fig. 11; fig. 14; col. 10 lines 52-67; col. 14 lines 42-50; col. 15 lines 1-22, 61-67; col. 16 lines 3-7]

60. As to claim 39, Hui (modified by Sugiyama and Simpson) teaches a video preprocessor that performs picture decimation under control of the rate controller. [Sugiyama - Fig. 7; Fig. 11; Fig. 14; Col. 15 lines 10-19, 61-67; Col. 16 lines 3-7]

61. Claim 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hui US 6,654,417 B1 further in view of Sugiyama US 6,940,911 B2 further in view of Simpson et al. (Simpson) US 6,724,817 B1.

62. As to claim 35, Hui (modified by Sugiyama) teaches the limitations of claim 34.

Hui (modified by Sugiyama) is silent as to the video coding chain further deletes transform coefficients under control of the rate controller.

Simpson teaches the video coding chain further deletes transform coefficients under control of the rate controller. [Simpson - fig. 1 (18); fig. 2 (118); col. 5 lines 5-59; col. 3 line 66 - col. 4 line 25]

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings to Simpson with the device of Hui (modified by Sugiyama) allowing for improved data transmission. [col. 1 lines 15-27]

63. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hui US 6,654,417 B1 further in view of Sugiyama US 6,940,911 B2 further in view of Tsuru US 6,950,040 B2.

64. As to claim 37, Hui (modified by Sugiyama) teach the limitations of claim 34.

Hui (modified by Sugiyama) silent as to the video prediction chain comprises a deblocking filter whose mode of operation is controlled by the rate controller

Tsuru teaches the video prediction chain comprises a deblocking filter whose mode of operation is controlled by the rate controller. [fig. 2; col. 1 lines 12-15; col. 6 lines 3-12]

It would have been obvious at the time the invention was made to combine the deblocking filtering teachings of Tsuru with the device of Hui (modified by Chiang and Kim) improving image quality.

Conclusion

65. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNER HOLDER whose telephone number is (571)270-1549. The examiner can normally be reached on M-Th, M-F 8 am - 3 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Anner Holder/
Examiner, Art Unit 2621

/Tung Vo/
Primary Examiner, Art Unit 2621